



MOMENTUM FOR FUTURE PROSPERITY

**LAKEHEAD UNIVERSITY'S STRATEGIC
RESEARCH PLAN (2007 - 2012)**

*Approved by Senate
March 23, 2007*

TABLE OF CONTENTS

	<u>Page</u>
1. Committee Composition	4
2. Lakehead University’s Research Vision, Mission, and Goal	
Research Vision	5
Research Mission	5
Research Goal	5
3. Momentum for Future Prosperity: Lakehead University’s Strategic Research Plan for 2007-2012	
Introduction.....	6
Achievements.....	6
Research Plan Objectives.....	7
4. Strategic Research Priorities	8
5. Research Capacity Building and Enhancement of Research Culture	
Strategies to Enhance Recruitment	10
Strategies for Faculty Retention	11
Strategies to Enhance Research Culture	12
6. Training Researchers	
Strategies to Enhance Graduate Studies	12
7. Knowledge Transfer and Partnering	
Strategies for Enhancing Knowledge Transfer and Partnering	13
8. Research Administration	
The Role of the Senate Research Committee	15
The Role of University Research Administration Structures	15
The Role of Faculties and Departments.....	16
The Role of University Research Centres.....	16

9. Institutional Support for Research	
Strategies for Investment of Internal Research Support	17
Seed Funding	17
Infrastructure Support	17
Library Resources	18
Research Expertise Databank	19
10. Research Outreach and Internationalization	
Strategies to Enhance the National and Regional Context of Research	19
Strategies for Internationalizing Lakehead University’s Research	20
11. Research Performance Indicators	
Research Output and Recognition	20
Research Funding	21
12. Research Celebration and Awareness Building	
Celebration.....	22
Awareness Building	22
Principles for Research Celebration and Awareness Building	23
Strategies for Enhancing Celebration and Awareness.....	23
13. Conclusion	24
14. Appendix I	
Priority A: Aboriginal Studies	25
Priority B: Advanced Technology Systems.....	25
Priority C: Biotechnology and Material Science	27
Priority D: Culture and Society	27
Priority E: Environmental and Resource-based Development, Education, and Policy	29
Priority F: Health Research across the Life Span	30
Priority G: Northern Studies	31

LAKEHEAD UNIVERSITY STRATEGIC RESEARCH PLAN (2007-2012) DRAFTING COMMITTEE COMPOSITION

Dr. Rui Wang, Vice-President (Research) (*Chair*)*

Dr. Umed Panu, Associate Vice-President (Research)*
Dr. Laurie Hayes, Vice-President (Academic) and Provost*
Dr. Gary Boire, Dean, Graduate and International Studies*
Mrs. Anne Klymenko, Manager, Office of Research*
Dr. Lauri Gilchrist, Associate Vice-Provost, Aboriginal Initiatives
Dr. Ron Harpelle, Chair, Senate Research Committee (2004/05)
Dr. Lada Malek, Chair, Senate Research Committee (2005/06)*
Mrs. Eleanor Abaya, Director of Communications
Ms. Barbara Eccles, Manager, Technology Transfer, Innovation Management Office
Mrs. Anne Deighton, University Librarian*
Mr. Leslie Praisley, Graduate Student
Dr. Bruce Strang, Department of History (SSHRC Representative)
Dr. Heidi Schraft, Canada Research Chair, Department of Biology (NSERC Representative)
Dr. Mohammad Uddin, Department of Electrical Engineering (NSERC Representative)
Dr. Michel Bédard, Canada Research Chair, Dept. of Psychology (CIHR Representative)
Dr. Chris Southcott, Department of Sociology (SSHRC Representative)*
Ms. Janice Pellizzari, Secretary to the Committee*

Senate Research Committee – 2006-07

* Above noted are also Members of the Senate Research Committee

In addition to:

Dr. Henri Saliba
Dr. John O'Meara
Dr. Monica Flegel
Dr. Will Wilson
Dr. Christine Gottardo
Dr. Peter Hollings
Dr. Baoqiang Liao
Mr. James Brazeau, Graduate Student
Mr. Ben Lavoie, Graduate Student

LAKEHEAD UNIVERSITY'S RESEARCH VISION, MISSION, AND GOAL

Research Vision:

Lakehead University will be recognized regionally, nationally and internationally as a research-intensive university. In selected pre-eminent areas of research, Lakehead University will become a world leader.

Research Mission:

Lakehead University is committed to excellence and innovation in research, scholarly work, and other creative activities. Lakehead University recognizes the importance of these activities in enhancing the educational experience of all students. Lakehead University values the research contributions and achievements of its people, as well as the diversity of their ideas emerging from all disciplines. Lakehead University expects and encourages all of its faculty members to be actively engaged in research, knowledge transfer, and other scholarly activities. Finally, Lakehead University is committed to educate and train highly qualified personnel to contribute to research and innovation in society.

The importance of research and its link with teaching are clearly identified in the University's Mission Statement:

“Lakehead University is committed to excellence and innovation in undergraduate and graduate teaching, service, research and other scholarly activity. As part of this commitment, Lakehead University is dedicated to a student-centred learning environment.”

Lakehead University's Strategic Plan 2005 – 2010

Lakehead University's Academic Plan also outlines the following principles informing our research and scholarly culture:

“1) Every researcher is a teacher; 2) Research and other scholarly activities are defining characteristics of a university; 3) We recognize the importance of basic research, applied research, and scholarly activity; 4) Research requires adequate infrastructure; 5) Graduate programs are inextricably linked with advanced research and, in many disciplines graduate students are essential components of the support structure for faculty research; and 6) Lakehead University should identify strengths in research.”

Lakehead University's Academic Plan 2006

Research Goal:

In the next 5-10 years Lakehead University will become one of the top 25 research-intensive universities in Canada.

MOMENTUM FOR FUTURE PROSPERITY: LAKEHEAD UNIVERSITY'S STRATEGIC RESEARCH PLAN FOR 2007 - 2012

Introduction

Globally, research and scholarship have been recognized as central to the role and function of universities, and research in particular is viewed as having inherent benefits to society. Research conducted at universities drives innovation, stimulates the creation of new knowledge, and is the foundation for a vibrant, and growing civil society. Theoretical research creates a body of knowledge that has value for society although it may not be readily apparent in the short-term. The application of research outcomes also has direct benefits to regional and national economic growth. External research funding is critical to the growth of a university's research capacity. Furthermore, research excellence raises the profile and reputation of a university and its faculty members nationally and internationally.

Lakehead University is transforming itself from a comprehensive university to a more research-intensive university. It is Lakehead University's goal to rank among the top 25 research-intensive universities within the next 5 – 10 years. Although Lakehead is ranked 38th in research intensity in Canada by Re\$earch Infosource Inc. in 2004, we believe that our goal is achievable given Lakehead University's research achievements over the past five years and innovative strategies outlined in this Strategic Research Plan.

Achievements

External research funding awarded to Lakehead faculty has more than tripled in the past five years (\$4.6 million in 2000/01 to \$18.1 million in 2004/2005) and many excellent research programs have resulted in significant recognition by, and funding from, the major Canadian research granting agencies (NSERC, SSHRC, CIHR). New research programs have been made possible at Lakehead University as a result of major investments (\$14.5 million to date) in research infrastructure by agencies such as the Canada Foundation for Innovation (CFI), Ontario Innovation Trust (OIT), Ministry of Economic Development and Trade (MEDT), FedNor, NOHFC, etc.

Lakehead University has seen the number of graduate programs increase from 18 in 2000/01 to 29 in 2004-05, reflecting the enhancement of our faculty's research capacity and productivity. Three Ph.D. programs are presently being offered in the Faculty of Education, the Faculty of Forestry and the Forest Environment, and the Department of Psychology in the Faculty of Social Sciences and Humanities. In 2005, as a result of our unprecedented growth in graduate programs, the Faculty of Graduate Studies was established. The Faculty of Graduate Studies will coordinate efforts to promote graduate

studies, facilitate interdisciplinary graduate programs, and foster a sense of community among graduate faculty and students.

Existing research strengths have been enhanced and new research clusters have emerged as a result of the presence of 12 active research centres, recruitment of seven Canada Research Chairs, and the hiring of 109 new faculty members since 2002. The establishment of the joint Lakehead University/Laurentian University Northern Ontario School of Medicine and ICR Discoveries will foster the development of new emerging research clusters in the area of health. Through the Lakehead University Centre for Analytical Services (LUCAS), research expertise is now easily accessible to partners in northern Ontario. As a result, partners now have a greater appreciation of the role research plays in regional socio-economic development.

While many accomplishments have been realized, many challenges and barriers continue to impede research growth at Lakehead University. For example, many researchers at Lakehead have higher-than-average teaching and administrative loads resulting in research funding and productivity outputs below their counterparts at some other research-intensive universities. Additional financial resources and internal mechanisms to support research growth are needed. Research equipment needs upgrading, deferred maintenance is at an all-time high, library resources are insufficient, and start-up grants are limited. Resources and mechanisms to ensure strategic recruitment and ongoing retention of researchers and research trainees are also insufficient or inadequate. The above issues are critical to the success of this plan and should be addressed.

In order to address some of these challenges while at the same time ensuring that past research growth and strengths are sustained and fostered, Lakehead University recognized the need to renew its Strategic Research Plan. The Vice-President Research appointed an advisory committee in June 2005 composed primarily of academic colleagues drawn from the social sciences, humanities, natural sciences, engineering and health areas. The advisory committee, referred to as the Strategic Research Plan Drafting Committee, met frequently and consulted widely within the University community. Advice and views of faculty were solicited broadly, and incorporated wherever possible. This draft plan was then submitted to the Senate Research Committee in September 2006. The Senate Research Committee further revised the plan after a series of consultations and approved its submission to Senate.

Research Plan Objectives

Based on the input received from the university community, and to pave a clear path for achieving Lakehead University's research goal, a set of major objectives of the Strategic Research Plan of Lakehead University were established:

- to maintain and enhance research capacity in existing areas of research strength that are prominent at, or unique to, Lakehead University among Canadian universities, while allowing for the development of new emerging areas of concentration, with the long-range objective of creating new institutional centres of research excellence;
- to enhance the resource availability for all faculty to effectively pursue their research programs;
- to strengthen interdisciplinary research activities for which Lakehead University is already known;
- to provide advanced research training through the enhancement, or development of new graduate programs especially at the Ph.D. level, as well as programs for postdoctoral fellows and visiting scholars;
- to provide opportunities for development of collaborations with community and private sector partners;
- to maintain and create research uniqueness and competitiveness to attract external funding opportunities to the university; and
- to make a significant contribution to the quality of life of Canadians and/or economic development of northern Ontario and Canada.

STRATEGIC RESEARCH PRIORITIES

It should be recognized that all research and scholarship will be valued by Lakehead University. Lakehead University will support the broad continuum of research, from basic theoretical/conceptual research and scholarly activity, to applied research. The Strategic Research Plan will support all faculty to effectively pursue their research programs. The areas of research priority identified in Lakehead's Strategic Research Plan do not represent the total research capacity within Lakehead University. In accordance with the principles outlined in Lakehead University's Academic Plan 2006, specific research clusters should be established in order to enhance our identifiable strengths.

In order to become one of the top 25 research-intensive universities, Lakehead University must focus its resources towards priority research areas. We must be in a position to invest scarce internal and external resources in focused research areas where we have a unique advantage and strength. In a fiscally challenged environment, universities have had to declare areas of research focus in order to increase research capacity and to compete nationally for funds from programs like the Canada Research Chairs (CRC), Canada Foundation for Innovation (CFI) and NSERC Research Capacity Development Program. These programs require universities to have Strategic Research Plans with clearly defined areas of priority in order to be eligible to apply and receive their funding. Without a Strategic Research Plan and identified priority areas, Lakehead University would not be in a position to access important provincial and federal funding opportunities. At the same time, Lakehead University should ensure that those researchers and scholars not linked to a cluster have the necessary resources to follow their respective

research programs.

Lakehead University envisions the strategic planning process to be dynamic and flexible, allowing new priority areas to develop should a unique opportunity present itself. Specifically, priority areas will encompass clusters of research activity which 1) present opportunities for interdisciplinary research and/or partnerships with the not-for-profit organizations, governments, and private sectors; 2) present an opportunity to develop new graduate programs, especially at the PhD level, or strengthen existing graduate programs; 3) have a proven ability or strong potential of attracting peer-reviewed and other external funding; 4) will benefit Northwestern Ontario and Canada in terms of social and economic development; and 5) will foster synergistic research activity among our researchers that will benefit Lakehead University, the region, and Canada as a whole.

The research priorities identified in the Strategic Research Plan will be used for the purpose of allocating new resources including: 1) funding allocated to the Canada Research Chair Program and Canada Foundation for Innovation; and 2) new research programs requiring universities to allocate funding in accordance with priorities set out in their Strategic Research Plans (e.g., SSHRC Aid to Small Universities program, NSERC Research Capacity Development Program, CIHR Institutional Development Grant, etc.).

Current internal funding allocated to the Senate Research Committee will not be affected by the priorities established through the Strategic Research Planning process. Internal funds distributed by the Senate Research Committee will continue to support the development of research capacity broadly at Lakehead University in accordance with the guidelines approved by Lakehead University's Senate. In fact, enhanced research activities in areas of research priorities determined at Lakehead University may help increase Tri-Council grants that will in turn positively impact the funding allocations to the Senate Research Committee.

The following areas will be Lakehead University's research priorities (justification for priority areas are provided in Appendix 1). It should be noted that these priority areas are listed in alphabetical order, not in order of importance or priority.

- Aboriginal Studies
- Advanced Technology Systems
- Biotechnology and Material Science
- Culture and Society
- Environmental and Resource-based Research Development, Education and Policy
- Health Research Across the Lifespan
- Northern Studies

The following principles will also support decision-making when allocating resources to

priority areas:

Excellence and Innovation: The University will strive to support world-class research with the ultimate goal of generating tangible returns to society.

Learning: The University will promote the integration of research and teaching at the undergraduate and graduate level so that students can learn from, and participate in, the development of new knowledge and discoveries.

Interdisciplinary: The University will encourage interdisciplinary approaches to research.

Diversity: The University will support both basic and applied research in all disciplines.

Relevance: The University will contribute to the social, cultural, and economic development of the region, country, and world, leading to an improved environment and health for all people.

RESEARCH CAPACITY BUILDING AND ENHANCEMENT OF RESEARCH CULTURE

Lakehead University recognizes that one of its most important resources is the researchers it supports. The recruitment and retention of promising and active researchers are key initiatives to lay the foundation on which Lakehead University will depend to achieve its strategic research goal. Clearly, strategies focusing on only one of these would be inadequate; once we attract qualified and productive researchers we have to ensure that we retain them. Lakehead University faces numerous challenges in the recruitment and retention of the best scholars. These challenges include, but are not limited to: geographical isolation, smaller academic unit sizes, higher teaching load, limited internal resources, and fewer graduate students.

Strategies to Enhance Recruitment

As long as the specific teaching needs of individual academic units are addressed, and provided that each candidate's teaching qualifications are equal, the recruitment of new faculty members at Lakehead should emphasize the candidate's research potential and excellence in line with Lakehead University's strategic research priorities.

A successful recruitment plan for a university such as Lakehead is to develop a flexible approach to recruiting the best candidates. Newly hired faculty members are very concerned about establishing their research programs, and Lakehead University must make every effort to provide them with the necessary opportunities to do so. Clearly it is important to provide adequate and competitive start-up grants. However, mindful of the

need for new faculty to establish a peer-reviewed funding record, it is important to provide flexible starting times for those who may wish to have lead-time to prepare grant applications. Also, the provision of adequate course release in the first two years would enable new faculty members to devote more time to the establishment of their research programs. Other strategies should be pursued to significantly reduce the percentage of declined offers made by Lakehead University to new faculty after systematic analysis of this phenomenon.

Most potential candidates have partners who may be looking for employment opportunities at Lakehead or elsewhere in the community. The establishment of a support mechanism to facilitate the recruitment of partners (e.g., development of contacts with potential employers from the community) would present an attractive opportunity to families who may be considering Thunder Bay as a community to live in.

According to the principles outlined in the Lakehead University Academic Plan 2006, to enhance research opportunities with limited resources, it is desirable to invest in strong clusters of research activities. Therefore, recruitment efforts should focus on areas of research priority whenever possible. Furthermore, policies for cross- or joint-appointments should be developed to facilitate interdisciplinary research programs. In addition, mechanisms for the appointment of full-time faculty with external salary funding should be developed. This approach may allow the university to increase its research capacity without additional costs.

Strategies for Faculty Retention

Because research is intrinsically linked to the role of a faculty member, the importance of research should be reflected in 1) the on-going support provided, 2) the recognition of the work accomplished, and 3) efforts to retain faculty.

Retention of our established researchers should be improved with concrete approaches. Academic units and university administration should work together to identify the reasons for departure of our researchers for other employment opportunities. Salary levels, lack of recognition, inequitable teaching and administrative loads, difficulty in recruiting research trainees, lack of appropriate research space, and lack of spousal employment opportunities may be some of the reasons why researchers leave Lakehead University.

Mechanisms should be put in place to provide course releases to researchers who devote a significant amount of time to research activities or research administration. Similarly, a faculty member's involvement in the supervision of graduate students should be recognized and rewarded. Specific funding mechanisms should also be implemented to support and encourage established researchers at Lakehead University who have experienced difficulty in continuing their research momentum or resuming their research activities. Finally, the University should consider the development of a policy to address

the potential loss of faculty members with a significant research record who are being actively recruited by other universities.

Strategies to Enhance Research Culture

To enrich our research culture and implement our research agenda, all faculty members, newly recruited or established, should have active research and/or scholarly activity programs.

Allocation of the University's operating budget and other resources towards research and scholarly activity should be increased.

The number of interdisciplinary research centres and inter-departmental/Faculty joint appointments should be increased. At least two new interdisciplinary PhD programs should be established during the next five years. More post-doctoral fellows and visiting scholars should be recruited. A university policy for administration of post-doctoral fellows and visiting scholars should be developed.

Researchers cannot conduct research in a vacuum. Lack of research space on campus is a serious challenge for our research agenda. This problem would be partially solved by a new research building and enhanced research space. Furthermore, existing research space should be systematically audited and strategically allocated to maximize their usage.

TRAINING RESEARCHERS

Training researchers plays an integral role in our research. Trainees carry out many research activities on campus and represent the future of our research and innovation. The recruitment of research trainees to Lakehead University and the creation of a supportive environment for them are major challenges. In order to address these challenges, Lakehead University and its newly founded Faculty of Graduate Studies need to foster a vibrant graduate research culture and provide financial and infrastructural support to our trainees.

Strategies to Enhance Graduate Studies

Lakehead University will endeavour to create vibrant research-intensive graduate programs, especially new interdisciplinary PhD programs. Graduate supervisors must be trained to be mentors who regularly include student funding in their own research grant applications. In addition, Lakehead will strive to provide all graduate students and post-doctoral fellows with a basic minimum financial support package for the regular duration of their training programs. The benefits of Graduate Assistantships (GA) to foster research training could be maximized by increasing flexibility to allocate GA duties,

and by allowing the use of GAs to support a trainee's research activities. Lakehead University will also aim to eventually remove the differential tuition fee for international graduate students, which will greatly enhance recruitment efforts. Furthermore, Lakehead University will work to ensure that students have the opportunity to complete their graduate studies in a timely fashion.

Research trainees should also be encouraged to disseminate the results of their research in the form of publications and national and international conference presentations as part of their training requirements. Programs for trainees should be developed to improve their grant-writing skills and scholarly competitiveness. Writing-skill workshops could be offered to improve graduate students' skills in thesis preparation and to encourage publication of trainees' thesis work. In addition, research trainees should be provided with adequate infrastructure for their respective disciplines.

KNOWLEDGE TRANSFER AND PARTNERING

Knowledge transfer has been occurring at universities in a variety of ways since the institutions were first created over nine centuries ago. Further, this commitment to knowledge transfer, particularly to communities, increased dramatically with the advent of publicly funded universities in North America in the 19th and 20th centuries. Lakehead University is a dynamic part of this publicly funded university tradition and, as part of its mandate it is committed to promote knowledge transfer in order to meet the needs of the people of Northwestern Ontario and beyond. Traditional methods to transfer knowledge have included teaching, mentoring students, publishing papers, writing books and technical reports, and conducting various forms of community extension services, such as community classes and workshops. Knowledge can also be transferred to others by partnering with industry and other research partners and through the commercialization of certain research outcomes. However the commitments we have as a publicly funded institution to the people of Ontario and Canada should remain pre-eminent.

As the University continues to expand with increased numbers of faculty members and students, the amount of knowledge transfer activity will grow proportionately. Some forms of knowledge transfer that have recently gained prominence, such as partnering with industry and commercialization of research outcomes, are not widely understood, both within and outside university campuses, and must be examined carefully to ensure their appropriateness within the framework of a publicly funded institution. Limited funding also restricts knowledge transfer. Inappropriate handling and funding of knowledge transfer can be a threat to academic freedom or restrict the transfer of knowledge from researchers to the world.

Strategies for enhancing Knowledge Transfer and Partnering

Lakehead University is committed to the implementation of the following strategies to foster increases in the quality and quantity of knowledge transfer activities. We will: 1)

continue to identify adequate mechanisms and resources for supporting all forms of knowledge transfer; 2) develop appropriate metrics to measure success in all forms of knowledge transfer; 3) expand orientation programs for new researchers on all forms of knowledge transfer and foster the participation of researchers and research trainees in this crucial activity; 4) increase the number of public educational talks, workshops, and other publicly accessible knowledge transfer activities; 5) expand our participation in national and international knowledge transfer to communities, particularly where such actions can lead to achieving national and international development goals; 6) explore and support the creation and use of Open-Access electronic journals, which can benefit from the advanced technology now located on this campus; 7) continue our exploration of the many issues regarding intellectual property, commercialization, intellectual property related contracts, and business-development related matters; 8) encourage the staff of the Innovation Management Office (IMO) to participate in departmental meetings, faculty and graduate student talks, science fairs, community meetings, and other University information sessions; 9) sustain and expand the operation of the IMO and other knowledge transfer bodies; 10) take a proactive approach in maximizing new research opportunities, including collaborations with communities, governments, international partners, non-government organizations, industry ; and 11) encourage and celebrate all forms of knowledge transfer.

It is vital that those Lakehead University researchers who choose to commercialize their research outcomes, partner with external stakeholders, or otherwise transfer the knowledge they have gained through their research activities, are fully informed of the potential risks of such activities and be properly supported throughout the process by commercialization and legal experts. In order to ensure that the rights of Lakehead University researchers are properly preserved it is crucial to adequately fund all forms of knowledge transfer activities.

RESEARCH ADMINISTRATION

In order to sustain and foster research activity, universities must ensure that sufficient resources are in place to support and facilitate the efficient administration of research in accordance with accountability standards established by the Tri-Council MOU and by other funding agencies. Research administration includes planning and promoting research; assisting researchers with the preparation of research proposals; public relations; financial, departmental and other administrative services, including information systems to track grant applications; certification (ethical treatment of humans and animals in research); and management of human resources, payroll, purchasing, audit, and health and safety (including biosafety). Both recent growth in research activity and increased institutional accountability have placed additional pressures on research administration and researchers. Lakehead University is committed to supporting its research enterprise by increasing support to researchers and by enhancing the efficiency of research administration. Research will be supported by administration at all levels at Lakehead University.

The Role of the Senate Research Committee

The Senate Research Committee has a mandate to facilitate research at Lakehead University by promoting and supporting excellence and growth in research across the campus. The Committee will strive to achieve this overarching objective in several ways, some of which are outlined below.

The Senate Research Committee will undertake an active role in refining and instituting improved selection criteria for membership on the Senate Research Committee.

The Committee will strive to encourage excellence, to support and develop Lakehead University's research priorities, and to actively participate in university research planning and policy making. To recognize our best researchers, the guidelines and standards for the Distinguished Researcher Awards and Research Contribution Awards will be revised, and other awards will be instituted, to encourage, enhance, and celebrate research excellence at Lakehead University. Furthermore, selection for awards and related decisions will be sensitive to discipline-specific approaches.

The Committee should facilitate peer-reviewed internal competitions, especially where a limited number of applications are allowed to be forwarded by Lakehead University for funding such as SSHRC ASU, CFI Leaders Opportunity Fund and other similar research programs. Further, the Committee will provide incentives and support to new faculty members who apply for external Tri-council and other research funding.

The Role of University Research Administration Structures

The Office of the Vice-President Research, the Office of the Associate Vice-President Research, and the Office of Research are responsible for maintaining and enhancing a collegial research environment at Lakehead University. Under this directive, the offices will support the individual efforts of researchers as well as encourage and coordinate inter- and multi-disciplinary research activities. In addition, the offices will organize university-wide research planning as well as establish and implement different research and ethics policies, and strive to improve communication with researchers of these policies. On a continual basis, the Office of Research will identify and support new initiatives that build upon existing research strengths.

To support, facilitate, and enhance the University's Strategic Research Plan, new external funding opportunities will be pursued and continual increases will be sought for internal funding support for research. The Office of Research is also responsible for the administration of internal and external research funds in accordance with funding agency guidelines.

In addition, the Office of Research is responsible for providing research services to the faculty, including amongst others grant-writing workshops led by successful applicants

and leading researchers who can provide insights and examples of winning proposals. Such an activity of bringing together established and new researchers in a congenial forum will enhance the formation of a peer-review/mentoring program where successful applicants mentor and lead other faculty.

Another responsibility of the Office of Research is to orient new researchers to Lakehead University, specifically its research environment, resources, and policies. In addition, the Office will develop a database to facilitate the reporting of research grant and contract applications, and awards and ethics certifications. The Office will also help to facilitate faculty participation in the Research Experts Database. In cooperation with the Faculty Deans, the Office of Research will help to standardize the collection of data on research and scholarly outcomes (i.e., Faculty Annual Report) to streamline and track research and scholarly performance.

The Office of Research is responsible for enhancing and advancing research activity as well as promoting integrity in all research endeavors at Lakehead University. This includes working closely with the Faculties, research centres on campus, and other University offices (Physical Plant, Finance Office, Human Resources, etc.) to facilitate research administration. Such a congenial mode of communication will allow for the transfer of information to researchers regarding the policies and procedures at the University. A free-flow of communication between the Office of Research and the university's numerous researchers will enhance improved co-ordination and reporting.

The Role of Faculties and Departments

Faculties and Departments will be encouraged to pursue the research goals established and affirmed in the Lakehead University's Strategic Research Plan by actively facilitating and supporting research activities in their units. As well, in relation to the capacity of the academic units, it should be ensured that researchers are provided with the required resources to conduct their research. These may include allocation of research space and sabbatical arrangements. Furthermore, all Faculties are encouraged to designate one coordinator of research to facilitate research activities. To encourage and improve the success rates of junior faculty in external granting competitions, a department/faculty-based mentoring program should also be established.

The Role of University Research Centres

University research centres are research organizations at Lakehead University that are accountable to the Vice President-Research. The Centres will be encouraged to align themselves with the overall goals and objectives of the Strategic Research Plan of Lakehead University and actively seek and secure external research funding. In this regard, these research centres will administer and support interdisciplinary/multidisciplinary research activity and training programs. In addition, such centres would maintain and renew large-scale research infrastructures and facilities.

These centres will be required to submit an annual report to the Vice President-Research and other sponsoring organizations, outlining research progress as well as future goals and objectives.

INSTITUTIONAL SUPPORT FOR RESEARCH

In order to meet Lakehead University's goals in a fiscally challenged environment, the University must strategically invest new internal resources in areas of research priority. Such internal research investments will build upon our strengths and be guided by the University's priorities, which in turn have been established through Academic Planning and Research Planning. Internal resources are necessary to increase Lakehead University's research capacity to compete for external research funding, to achieve research excellence and to raise the profile and reputation of Lakehead University and its faculty members nationally and internationally. Although past CFI investments have increased Lakehead University's research productivity, Lakehead University has been challenged to find the internal resources to operate and maintain research facilities, and diverse library resources. Lakehead University is committed to strategically allocate internal research resources to nurture and support its research enterprise.

Strategies for Investment of Internal Research Support

Internal funding to support development of research capacity should be increased from University operating budgets or other internal funding sources, and Lakehead University will make a concerted effort to invest scarce internal resources in support of the University's research mandate. The University should aim to provide more resources for grant application support and seek out new research funding opportunities

Seed Funding

Internal investment is necessary to increase research capacity that will result in increased competitiveness in national research granting competitions. For example, a research publication fund should be established through a collective effort from all levels of research administration to increase the number of peer-reviewed scholarly publications. In addition, all levels of administration should collectively work to increase research travel funds for researchers and trainees, especially for new faculty who do not yet have external research funding. Matching fund mechanisms should be established to complement new funding opportunities and initiatives from external funding bodies, which often require the university to provide internal resources (i.e., ERA, CFI, SSHRC KIS programs, etc.).

Infrastructure Support

It must be recognized that Lakehead University has insufficient funding to address the deferred maintenance issue. However, deferred maintenance of research laboratories

and offices for researchers and trainees should be a priority. Lakehead University will make a concerted effort to allocate internal funding to Physical Plant for emergency operation and ongoing maintenance of research facilities. In addition, the University's Space Committee should establish a clear timeline by which it will audit and evaluate the efficiency of the usage of existing research space on campus. All new faculty members recruited to Lakehead University must be given research space appropriate to their needs. Finally a new research building to support growth in the sciences and engineering is urgently needed.

Library Resources

The Library is an essential component in realizing the University's research goal.

Historically, the Library's books and periodicals budget has been directed toward resources in support of undergraduate programming and in a more limited capacity toward graduate programming. Funding levels have made it impossible to fully address faculty research needs without sacrificing the needs of the undergraduate students. Nevertheless, the Library in recent years has been successful in participating in a number of consortial purchases of electronic subscriptions on both the national (Canadian National Site Licensing Project - CNSLP) and the provincial (Ontario Council of University Libraries - OCUL) levels. These consortial purchases have provided Lakehead University faculty with access to products such as Elsevier's Science Direct, electronic journal suites from Oxford University Press, Blackwell Synergy and Cambridge University Press, Project Muse and most recently the IEEE/IEE Electronic Library (IEL), to name a few. Inflation, however, puts in jeopardy the Library's ability to continue to maintain these subscriptions. A mechanism must be established to ensure the library's material budget is increased annually to offset the effects of inflation. As well, there are other resources which to date the Library has not been able to purchase and will require additional funding in order to do so. The CFI has provided a portion of the initial funding for the science and technology products that were part of the original CNSLP but similar outside funding has not been available for products in the social sciences and humanities.

The Library should endeavour to improve services for faculty conducting research at Lakehead including providing one-on-one consultation between a Librarian and the researcher, developing sessions to address the research needs of faculty and ensuring expert assistance is available for researchers utilizing specialized resources such as those for geospatial data and data sets. The Library needs to solicit input from the various research areas at Lakehead to determine how it can support their specific research needs. A strategy including a commitment for new funding will then be implemented to ensure the Library has the ability to meet the identified needs whether they are additional human resources, equipment, and/or new resources.

Research Expertise Databank

A proper Lakehead University research database should be made publicly available through the Internet. This database should not merely indicate research interest. It should contain information about research funding obtained by individual faculty members, and information about publications and other scholarly activity. In this way faculty members would be in a better position to identify and partner with colleagues in other fields. The database will also make researchers accessible to prospective graduate students as well as the media.

RESEARCH OUTREACH AND INTERNATIONALIZATION

Collaborations between Lakehead University and the broader regional, national and international research community (i.e. governments, private sectors and non-governmental organizations) are essential to Lakehead University's future research growth. Regional uniqueness and strengths should be continuously enhanced through research emphasis on regional issues. Internationalization would also enhance exposure of regional issues to national and international arenas.

Knowledge transfer involving Canadian universities transcends national boundaries and includes such activities as international research collaboration, international student exchanges, attracting outstanding international students, especially at the graduate level, visiting scholars, and developing international partnerships with higher education institutions around the world. Global skills and knowledge are an essential component of a quality university education. Students need exposure to ideas and people from around the world in order to build understanding and cross-cultural skills and to help them adapt to the demands of a rapidly changing world.

Lakehead University is committed to research outreach and internationalization by supporting and fostering research collaborations.

Strategies to Enhance the National and Regional Context of Research

Lakehead University will continue to facilitate and enhance existing and new research collaborations with regional partners, such as CNFER, ICR Discoveries, Quetico, Fort William Historical Park, Thunder Bay Regional Health Sciences Centre, Aboriginal organizations, etc. Lakehead University will also continue to support its Faculty of Medicine (the Northern Ontario School of Medicine, NOSM) and collaborate with the Molecular Medicine Research Centre in promoting biomedical research. In order to boost research and knowledge-based innovation for local and regional development, Lakehead University will collaborate with the City of Thunder Bay and other economic development agencies (i.e., FedNor and NOHFC). This includes fostering of research linkages with industry and the private sector.

The collaboration of faculty members with other researchers at Canadian Universities should be supported. This would include participation in existing provincial and federal Centres of Excellence and the pursuit of the creation of new Centres of Excellence. Collaborations with Confederation College in building research capacities of mutual interest will be facilitated. Lakehead University will continue to foster Northern research through national and international linkages such as the Association for Canadian Universities for Northern Studies (ACUNS).

Strategies for Internationalizing Lakehead University's Research

Institutional student and faculty mobility programs should be promoted to increase international research collaborations (e.g., University of the Arctic and NAFTA Canada-US-Mexico HRSDC Mobility programs). Research collaborations with foreign universities, including exchanging researchers and trainees should be facilitated (e.g., the Biotechnology, Telecommunications and Robotics Engineering units at the University of Oulu, Finland). Research-based degrees in collaboration with foreign universities should be fostered and created. Lakehead's involvement in international development work should consider incorporating international research outcomes whenever possible. New international funding opportunities (e.g., International Polar Year, Human Frontier Science Program) should be actively pursued and supported.

RESEARCH PERFORMANCE INDICATORS

Lakehead University's research strategic goal will be achieved in two steps. The first step is to become one of the top 30 research-intensive universities in Canada within five years (2007-2012), and the second step is to join the top 25 research intensive universities by 2017. To be comparable and measurable at the national level, research success at Lakehead University would be evaluated based on nationally acknowledged common criteria. At the same time, we will attempt to establish additional indicators that respect discipline specificity and varying types of scholarly output.

All indicators and strategic approaches listed below are used to evaluate Lakehead University as a whole in order to gauge our research progress and excellence in a national context. Guided by these university-wide indicators, different academic and research units of Lakehead University should correspondingly establish their own discipline-specific research success indicators.

Research Output and Recognition

Given that research funding levels may be different among different disciplines, research output is an ubiquitous indicator of research intensity. Research output takes various forms in different disciplines. Lakehead University recognizes all these forms of research output.

A database listing publications should be established, which requires close collaboration among and participation by researchers, academic units, Office of Institutional Analysis, and research administration. Collection of this publication data could be enhanced by developing a computerized Faculty Annual Report.

If the challenges and limitations to University resource availability identified in the Strategic Research Plan are resolved in the next five years, increased research and scholarly output per faculty should be increased. Peer-reviewed scholarly output by faculty and graduate students will be encouraged and promoted. It is anticipated that other scholarly and creative works, books, non-peer-reviewed publications, conference presentations, community outreach, etc. will increase and be recognized, as well.

An important indicator of research excellence at Lakehead University is the recognition of its faculty at provincial, national, and international levels. An institutional mechanism should be put in place to support the nominations of Lakehead faculty for research awards (i.e., Killam award, Polanyi fellowships, etc.) on an on-going basis.

Innovation and knowledge transformation should be greatly increased with more patent applications and technology disclosures. It should be emphasized that innovation and knowledge transformation is far beyond patents filed and invention disclosures received. University spin-offs, jobs created, licenses, products launched, industry sponsored research carried out, etc. should also be included in an acceptable set of metrics to properly measure our success in this field.

Research Funding

Research funding supports research projects, training of highly qualified personnel, and presentation and publication of research discoveries. Although some research areas do not require significant research funding, such as those of the humanities and social sciences, training of graduate students (our future scholars in these fields), publication and presentation of research results, and access to library and literature resources, to name a few, even in these fields do need certain levels of funding.

Between 2007 and 2012, Lakehead University as a whole needs to increase its research funding level by at least 50% from the previous research planning period (2000 – 2005).

Coordinated and organized by the Lakehead University Alumni Association, Alumni support towards university research should be significantly increased. The fundraising pledge form should allow for directing pledges towards specific research initiatives.

External scholarship awards and research grants to Lakehead University's graduate students and post-doctoral fellows should be significantly increased. Increasing our success rates for external awards allocated to Lakehead University, such as those from OGS and Tri-councils, and other sources of graduate awards will be pursued.

RESEARCH CELEBRATION AND AWARENESS BUILDING

Lakehead University will strive to create a culture of celebration and recognition of research at Lakehead University (internal), a more visible profile and image as a research-intensive institution (external), and a rich and accessible environment for undergraduate and graduate student research (internal and external). It is anticipated that greater research celebration and awareness building will result in greater public awareness of Lakehead's research strengths and achievements. This will facilitate Lakehead's ability to recruit outstanding students as well as external resources in support of research.

Celebration

The celebration of successes and achievements is crucial to any endeavour that relies on the knowledge inputs and monetary contributions of individuals and groups. Continual celebration is particularly important in institutional research, where research initiatives engage a number of partners in industry, government, and non-government organizations; where projects span over longer timeframes; or where individual researchers spend long periods of time in isolation researching, reflecting, and revising a manuscript.

Celebration not only acknowledges the intrinsic value of the contributions themselves, but especially validates the expertise, effort, time, cooperation, collaboration, and fundamental can-do attitudes that are integral to the success of any major undertaking. In the context of organizational management, an organization that encourages and supports a culture of celebration is sending the message that individual contributions are fundamental to organizational success, and that organizational support is key in helping individuals achieve their best.

Awareness Building

Internal and external awareness building is inextricably linked with developing a culture of celebration and is pivotal to Lakehead's research strategic goal. While internal awareness builds morale and stimulates discussion, collaboration, and partnerships, external awareness building raises the profile and enhances the reputation of both institution and researcher. The targeted dissemination of research results, impacts, and implications shall be undertaken on an ongoing basis to ensure that Lakehead and its researchers are viewed by their external peers and by appropriate organizations, governments, and potential partners in private industry as being on a par with - if not better than - the best researchers in academia.

Principles for Research Celebration and Awareness Building

Individual Recognition: Recognition is an integral part of a culture of celebration; the University will recognize individual researchers for their achievements whenever appropriate.

Inclusiveness: The University will ensure that research achievements from faculty members, highly qualified personnel, partners and collaborators are all recognized in an appropriate manner.

Transparency: The University will conduct its business in a transparent manner; celebration, recognition, and the bestowing of honour and accolades will be conducted in an open/visible process and in accordance with agreed-upon guidelines.

Engagement of the Public: Celebration will engage external stakeholders and the larger community wherever possible and appropriate.

Incentives: An incentive plan will be explored to support a culture of recognition.

Strategies for Enhancing Celebration and Awareness

Lakehead University will develop and execute a plan for internal celebration and external awareness building. The plan will be based on raising internal morale and enhancing the communication of research achievements regionally, nationally, and internationally where appropriate. Lakehead University will: 1) communicate internally all newsworthy research achievements via e-bulletin regularly; 2) hold celebration and awards ceremonies for accomplished researchers; 3) hold a media conference for all major announcements (includes the awarding of major grants, appointment of new research positions, crucial research findings, etc.); 4) send a media release to all appropriate print and broadcast media whenever a newsworthy research story breaks; 5) develop a research website that celebrates research achievement (e.g., a congratulatory page on the Research website singling out the “Researcher of the Month” and previous “Researchers of the Month”); 6) develop a Research Wall of Fame in a high-traffic area in the University to draw attention to “distinguished researchers”; 7) develop a Research Series in *The Chronicle Journal*; 8) explore the use of plasma screens on campus for advertising and promoting accomplished researchers; 9) utilize the website for repositioning and promoting a research culture; 10) investigate the merits of advertising in the local newspaper and media (as budget permits), highlighting researchers and their achievements regularly; 11) hold a Research Fair that highlights researchers and achievements, making these more accessible to the community; 12) investigate the development of a Research Publication that highlights researchers and projects, possibly with contributions from SPARK student writers; 13) ensure that research is highlighted in

the Annual Report, Lakehead Magazine, and/or Agora; and 14) pitch research stories to targeted publications such as University Affairs.

CONCLUSION

We believe this Strategic Research Plan will build research momentum for Lakehead University's future prosperity – namely to become one of the top 25 research-intensive universities in Canada. We envision this Strategic Research Plan to be a continuously changing and evolving document setting research principles and goals for future development. The Strategic Research Plan is expected to help guide the university in its planning, decision-making, and allocation of new research resources over the next five years. An implementation plan and timetable will be developed and presented to Senate for approval.

Appendix 1

Strategic Research Priorities (2007-2012)

(Please note that these priority areas are listed in alphabetical order, not in order of importance or priority.)

Priority A: Aboriginal Studies

Lakehead University has recognized the importance of Aboriginal program development, teaching, and training in post-secondary education to the socio-economic well-being of Aboriginal communities. The current prominence of the Aboriginal agenda in the university's mission statement is an indicator of continued effort to build capacity in Northern Ontario, in particular, and to join the provincial and national focus on northern and Aboriginal challenges. Aboriginal representation in all aspects of university governance, and program and research development is strengthened by the recruitment of a Canada Research Chair in Indigenous Education and by the establishment of a new Associate Vice-Provost position in the Office of Aboriginal Initiatives. Further, research strength exists in community-initiated collaboration with Aboriginal organizations and communities, and in established and emerging Aboriginal programs. We can continue the research initiatives at Lakehead that have already resulted in a new Department of Aboriginal Education. Lakehead University has the highest Aboriginal student enrolment for universities of comparable size (12%), and second highest of any university in Canada. New viable research and graduate programs can be initiated as the result of the establishment of a new Department of Aboriginal Education and the new Canada Research Chair in this area.

The impact of a viable and nurtured research focus on Aboriginal community challenges, arts, medicine, science, and culture is far reaching. In particular, Aboriginal health and wellness, education and methods of delivery, culture and heritage, and indigenous ways of knowing will be the multiple and interdisciplinary foci. The revitalization of language, culture, and self-governance that is currently underway can only be strengthened by post-secondary allies and advocates. In addition, the northern ecology will be protected and the economy will be enhanced by the addition of highly trained personnel in new and emerging fields of study. Such tangible returns will include employment, training, and further educational opportunities for the Aboriginal community.

Priority B: Advanced Technology Systems

Advanced technology systems comprised integrated hardware, software, and communication links form the primary and essential fibre of our modern society. In particular, advanced technology systems are important for our economy and environment

especially in Northwestern Ontario. The use of advanced technology systems, the efficiency of our paper mills, electric power stations, mineral exploration and extraction operations, to name but a few, in Thunder Bay and the region can significantly be enhanced and increased. Such efforts in innovation technologies would enhance reduction in greenhouse gas emissions and would thus provide a pivotal leading edge to our nation in meeting and exceeding the green-house gas emissions goals set in the Kyoto protocol. For example, the real-time monitoring and detection of green-house gas emissions can be achieved through innovations in the fiber laser technology. Given the relatively remote locations of some of our industries in the Northwestern Ontario region, there is an unusual lack of essential expertise available for the efficient operations of these industries. With technological innovations in remote sensing devices and reliable communication links, it is envisioned that the existing isolated industrial facilities such as forest harvesting operations, metal extraction and mining explorations, and hydro-power stations can be fully automated or controlled/monitored from a central location, i.e. Thunder Bay. It is thus envisioned that innovations in advanced technology systems would provide an impetus to bring the much desired economic benefits to our region and would also alleviate the working conditions of employees by narrowing the gap in order to avoid the need to work under hazardous situations.

At Lakehead University, there is a group of more than 30 faculty members from the Faculty of Engineering, the Department of Computer Science and the Department of Physics who have a strong background in the research area of advanced technology systems. All these researchers are well funded by NSERC and on an annual basis receive in excess of half a million dollars in grants. In aggregate, they have received over two million dollars in CFI grants as well as some funding from the industry. Currently, there are more than 40 graduate students in the Control Engineering program, 12 in the Environmental Engineering program, and 10 in Computer Science and Physics. All these graduate students, post-doctoral trainees, and visiting research engineers/scientists are engaged in research activities related to various aspects of advanced technology systems. Additionally, the efforts and research initiatives of the newly established Northern Ontario Web Intelligence (NOWI) research group from the Departments of Computer Science, Electrical Engineering, and Software Engineering at Lakehead University and in collaboration with the University of Regina and Laurentian University will further enhance and strengthen our research in advanced technology systems. The state-of-art research facilities that are currently available at Lakehead University such as Automatic Control Lab, Waste Management Lab, Process control lab, Power Electronics and Drives lab, Lab for Intelligent Mechantronic Systems, Virtual Reality Laboratory, and Super-computer and Photonics Lab, provide the necessary infrastructural support to foster innovations and research in advanced technology systems.

Priority C: Biotechnology and Material Science

Biotechnology in a broad sense is defined in Canada as the use of living organisms, or cellular and bio-molecular processes, to make new products, solve problems, or provide new methods of production (OECD 2005). Integration of biotechnology research with advances in material science stemming from research in the traditional inorganic sciences of physics, engineering, and chemistry is crucial to harness the full potential of these two areas. Significant research strength in environmental biotechnology, biomedical and molecular biotechnology, as well as in material science and nanotechnology exists at Lakehead University. Many new and established faculty, particularly from the Faculties of Science and Environmental Studies, Engineering, Forestry and Forest Environments, from the Northern Ontario School of Medicine, and the recently established Cancer Institute (ICR Discoveries), place increased emphasis on interdisciplinary collaborations in Biotechnology and Material Science.

More than 35 faculty conduct research in Biotechnology and Material Science at Lakehead University and they have attracted significant funding. In 2004/05 for example, these faculty received approximately \$560,000 in Tri-Council funding (NSERC and CIHR). In the same time period, they have secured major research grants and contracts from other sources amounting to approximately \$260,000.

Between 2000 and 2005 Lakehead University, supported by grants from CFI, OIT and FedNor, has invested close to \$3M on facilities and equipment for research in Biotechnology and Material Science. Three of Lakehead University's Canada Research Chairs work in the area of Biotechnology and Material Science, and Lakehead University is in the process of establishing a new interdisciplinary PhD Program in Biotechnology and an interdisciplinary Research Centre in Biotechnology. Several academic programs (undergraduate and graduate) support interdisciplinary biotechnology research including Anthropology, Biology (Applied Biomolecular Sciences Program), Physics, Chemical Engineering, Environmental Engineering, Chemistry, and Forestry.

The new knowledge and technologies developed through this research will lead to significant advances in the biomedical field and industrial applications, and improved manufacturing processes with less waste and less use of resources in a number of industrial sectors including pulp and paper, forestry, and mining.

Priority D: Culture and Society

Lakehead University has a strong tradition of research focusing on the complex ways in which cultures and societies develop, communicate, and organize themselves. Disciplines ranging from Anthropology to Women's Studies examine important issues facing societies today including: globalization; education; the environment; popular

culture, the arts, and communication; sexuality, gender, race, and ethnicity; poverty and social equality; the past and our relation to it and the future and our hopes for it. Such work draws upon a long tradition of the liberal arts in the academy, but also promotes and participates in interdisciplinary work with new and emergent disciplines, as well as engaging with and enriching research in the sciences. Research in the category of culture and society performs a crucial role in contributing to a valuable awareness of the power and complexity of representation, in enhancing Lakehead University's reputation as a comprehensive university, and in promoting and understanding the unique culture of Northwestern Ontario, both past and present, in a broader national and international context.

The Culture and Society category encompasses researchers who participate in text-based analysis and criticism, and who are actively engaged, through their creative and performance activities, in the field of cultural production itself. Furthermore, research in music directed towards the creation of critical editions for the purpose of performance, and research in literary studies that seek to uncover the exigencies governing literary production in the twentieth century for the purpose of promoting experimentation among literary artists, demonstrates the extent to which cultural analysis and cultural production can often be mutually complementary and enriching.

Lakehead University has many exemplary scholars operating in this priority area whose publications, awards, presentations, and creative work speak to the diversity and intellectual rigor of the work being produced. Furthermore, Lakehead University has a strong history of attracting tri-council funding in culture and society from a broad variety of disciplines, and faculty members in the creative disciplines have received both Canada Council and Ontario Arts Council funding. Researchers in this area also bring in substantial research funding from diverse organizations such as FedNor and the International Development Research Centre (IRDC), and scholars working within the framework of this research generated \$3,164,000 of research funding during 2004-2005. Two Canada Research Chairs in Indigenous Education and Techno-culture Studies form potential centres of excellence. Current graduate programs in Business, Economics, Education, English, History, Psychology, Social Work, and Sociology, as well as the interdisciplinary specialization in Women's Studies provide training for new generations of scholars, as do PhD programs in Education and Psychology. Lakehead University researchers have established strong ties to local and regional community and development organizations, to aboriginal communities, and to international scholarly organizations. Lakehead researchers in diverse fields will serve as an engine for economic and regional development of northwestern Ontario, will generate substantial new knowledge and new creative works that includes but also moves beyond the local level to encompass the past, present, and future nationally and internationally, and will integrate this learning in the classroom and the community.

Priority E: Environmental and Resource-based Development, Education, and Policy

Interdisciplinary research niches with application to the resource sector and environment have logically emerged from the fact that Lakehead University is situated in the Boreal Forest, one of the largest terrestrial ecosystems on earth, and in the watershed of Lake Superior, the largest surface body of fresh water in the world. Resource industries are vitally important to the sustained health and economic prosperity of the region and Canada and require advanced research capacity to address issues affecting future resource sustainability. Resource industries and resource-based communities also require new knowledge to address the environmental, social, and ethical challenges.

Significant research strengths in environmental and resource-based development, education, and policy exist at Lakehead University. Lakehead offers both undergraduate and graduate degrees of relevance to this interdisciplinary research area through the Faculties of Science and Environmental Studies (Geology, Biology, Chemistry, Physics, Water Resource Science), Social Sciences and Humanities (Economics, Sociology), Engineering, Forestry and the Forest Environment, Education, Business, and Professional Schools (Outdoor Recreation, Parks and Tourism). Research activity with applications to the resource sector and the environment encompasses over 50 researchers at Lakehead University who have an excellent record of research funding, work in interdisciplinary teams, and also have a strong history of collaborative work with the private sector and government. Approximately \$2.9 million dollars in external research funding was attracted by researchers in this area in 2004-2005, and approximately \$8.2 million dollars in CFI/Ontario infrastructure grants since 1998.

The forest sector is one of Canada's largest industrial employers and creates over 75,000 direct and 150,000 indirect jobs, with most of these being in northern Ontario. Forests and the forest sector will also be key in the economic development of Aboriginal communities and First Nations in Ontario. Researchers at Lakehead University are well positioned to undertake future research on sustainable forest management, development of value-added products, bio-fuels and other renewable energy sources, and non-wood forest products (e.g., bio-products and pharmaceuticals) which will help to diversify the forest sector in Northern Ontario and across Canada. Other examples of research relevant to this priority area include environmental bioremediation, urban forestry, impact of climate change, and the preservation of the biodiversity of plants and wildlife, water, and air quality.

The mining sector is equally important to the economy of northern Ontario and Canada. Furthermore, mining is a pillar of Ontario's economy, creating 90,000 jobs and \$1.8 billion in exports for Ontarians. Lakehead's departments of Geology, Chemistry, Chemical Engineering, and Biology have excellent linkages with the local mining and exploration

industry. Lakehead's researchers have contributed new knowledge of relevance to the mining sector. Projects have included studies on sustainable resource stewardship issues, understanding how ore deposits are formed, and the development of new exploration models, monitoring of mine waste, environmental assessment, and remediation of mine sites.

Lakehead University also has a long history of innovation in the fields of environmental education; as well it has the capacity to address the social and economic aspects of sustainable development in resource-dependent communities, regionally and globally through the Faculty of Education, the Faculty of Social Sciences and Humanities, the Faculty of Professional Schools and the Faculty of Business Administration.

Both researchers and industry working in the area of resource-based competitiveness and the environment have access to the latest scientific equipment and research laboratories through the Lakehead University Centre for Analytical Services (LUCAS), which includes the central Lakehead University Instrumentation Laboratory (LUIL), Aquatic Toxicity Research Centre (ATRC), Paleo-DNA laboratory, Lakehead University Environmental Laboratory (LUEL), Forest Soils Laboratory (FSL), Lakehead University Nutrient Ecology Laboratory (LUNE), Lakehead University Wood Testing Laboratory (LUWSTF), LEVTEC, and the Lakehead University Mineralogical and Experimental Laboratory (LUMINX).

Priority F: Health Research Across the Life Span

Approximately 75 faculty members (including two Canada Research Chairs) and 150 graduate students from various departments and faculties of Lakehead University are involved in health-related research. These researchers, supported with well over \$5 million in research grants for last year alone, aim at making a concrete difference in the health of our community. The research covers the age continuum, from children with special needs to older adults, underscoring the reality that health in old age is often determined by one's health in youth. The research conducted also has a focus on Aboriginal and Northern/rural issues, calling attention to the fact that Northwestern Ontario offers considerable challenges to the maintenance of good health.

While health research is already vibrant at Lakehead University, its potential for growth and fruitful partnerships both within academe and with government and private partners is considerable. This potential has been significantly enhanced with the establishment of the Public Health program and the Northern Ontario School of Medicine and ensuing discussions to develop new PhD, MD/MPH, and MD/PhD programs. Many established centres further support research in health-related areas. These include: the Centre of Excellence for Children & Adolescents with Special Needs, the Centre for Rural and Northern Health research, the Centre for Education and Research on Aging and Health, the Centre for Health Care Ethics, and ICR Discoveries. New partnerships are also being

developed with other community partners (e.g., Thunder Bay Regional Health Sciences Centre, St. Joseph's Care Group) to enhance health research. Through the activities of the University researchers and their partners, we can be assured that health research will continue to grow at Lakehead University, and will provide tangible societal benefits for the region and beyond.

Priority G: Northern Studies

Northern-based research has always been one of the Lakehead University's strengths. This originated from, but is no longer limited to, Lakehead University's regional mandate to serve Northwestern Ontario by conducting research on this region and regions with similar societies and environments. This research has been assisted by the presence of several existing programs at Lakehead managed by the Centre for Northern Studies, including the Northern and Regional Publications Program, Northern Studies Guest Speaker Grant, and the Northern Studies Faculty Travel Grant. The Northern Studies Resource Centre houses one of the best collections of Northern publications in Canada. The Centre for Rural and Northern Health Research and the Centre of Excellence for Children and Adolescents with Special Needs both concentrate on addressing the special needs of people living in rural and northern communities.

Several new programs, both within the university and within national funding agencies, have come into being that significantly increase the synergistic potential for northern research at Lakehead. These include the new Northern Studies academic program, a new Research Chair in Northern Studies, the Northern Ontario School of Medicine, Lakehead's membership in the University of the Arctic, increased funding for northern research under the federal government's new Northern Strategy, and increased research funding and research exposure related to the upcoming International Polar Year. Discussions have started on more graduate programs dealing with Northern Studies including the establishment of an Interdisciplinary Ph.D. program.

As well, there is also a need to increase our commitment to Northern research as part of our regional mandate. An example of this need is seen in the impact of climate change on environments such as Northwestern Ontario's Hudson's Bay Lowlands. Our region's polar bear population, permafrost conditions, and coastal communities are just a few of the elements being significantly affected.

Our location, our research expertise, and the synergy associated with major new programs makes us well placed to make a significant contribution to national and international research in the North over the next 5 years. This is particularly true in the areas of northern health, sustainable development in northern communities, northern boreal forest management, northern aboriginal issues, and northern education.